

What is claimed is:

1. A semiconductor laser device comprising:

a plurality of semiconductor laser diodes connected in series to one another;

5 a plurality of bypass diodes each connected in parallel to each semiconductor laser diode or each group of semiconductor laser diodes in all or a part of said semiconductor laser diodes and having a higher rising voltage than a rising voltage of said parallel-connected
10 semiconductor laser diodes,

that parallel connection being made in such a way that a polarity of one end of each of said semiconductors laser diode is the same as a polarity of that end of the associated bypass diode which is connected to said one end
15 of that semiconductor laser diode and a polarity of the other end of said semiconductor laser diode is the same as a polarity of that end of the associated bypass diode which is connected to said other end of that semiconductor laser diode.

20 2. The semiconductor laser device according to claim 1, further comprising heat sinks respectively fixed to said semiconductor laser diodes and each having a refrigerant inside.

25 3. The semiconductor laser device according to claim 2, further comprising a manifold which supplies said refrigerant to each of said heat sinks.

4. The semiconductor laser device according to claim 1, further comprising a first cooling member which is

connected to said bypass diodes to cool said bypass diodes.

5. The semiconductor laser device according to claim 4, wherein said first cooling member comprises a cold plate having a refrigerant inside.

5 6. The semiconductor laser device according to claim 2, wherein each of said bypass diode is fixed to that of said heat sinks which is fixed to the associated semiconductor laser diode connected in parallel to that bypass diode.

10 7. The semiconductor laser device according to claim 2, wherein each of said bypass diode is fixed to the associated heat sink in such a way that a p side of said bypass diode contacts said heat sink,

an n-type electrode is provided on an n side of said
15 bypass diode, and

said n-type electrode is connected to a p-type electrode of another bypass diode.

8. The semiconductor laser device according to claim 2, wherein an n-type electrode is provided at each of said
20 heat sinks via a first insulating member,

each of said heat sinks has a p-type electrode member in such a way that said p-type electrode member penetrates said first insulating member and said n-type electrode, and

a second insulating member is provided between said p-type electrode member and said n-type electrode.
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9. The semiconductor laser device according to claim 8, wherein said bypass diode is provided in place of said first insulating member,

said p-type electrode member is provided in such a way as to penetrate said bypass diode and said n-type electrode, and

5 said second insulating member is provided between said p-type electrode member and said n-type electrode and between said p-type electrode member and said bypass diode.

10 10. The semiconductor laser device according to claim 8, wherein an extension member is provided at said n-type electrode in such a way that a top of said extension member is positioned at a same height as a height from said heat sink to a top of said p-type electrode member.

11. The semiconductor laser device according to claim 3, wherein said bypass diodes are fixed to said manifold.

15 12. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 1.

13. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 2.

20 14. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 3.

25 15. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 4.

16. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 5.

17. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 6.

5 18. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 7.

19. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 8.

10 20. A semiconductor-laser excited solid-state laser apparatus having a semiconductor laser device as recited in claim 9.